California Department of Water Resources, Climate Change Technical Advisory Group, Subgroup on Climate Scenarios

Strengths/Weaknesses and Criteria for Climate Model Scenarios – 5-22-12

	12 CAT Scenarios	**5 BDCP Scenarios**	**CVP-IRP Modified BDCP Scenarios**
Strengths	• Scenario selection based on GCMs using criteria developed by CAT—More descriptive than a strength or weakness, as it stands • Climate evolves; dynamic future • Thoroughly peer reviewed in published literature. • Used extensively in past statewide impact evaluations. • Provides new examples of variability as displayed in projections; ~~,~~ doesn't rely on historical sequence of events for its inter-annual/inter-decadal variability. • Provides new, individual realizations of the future projection distribution.	• May capture wider range of possible potential future climate using a smaller set of scenarios • Includes 3 emissions scenarios • Based on information from the available 112 CMIP3 projections • Aggregation method de-emphasizes technical inconsistencies associated with individual climate projections	• Climate dynamically evolves through time. • Same strengths as BDCP
Weaknesses	• Ended up being biased toward drier side of projections • May not capture realistic climate variability, especially at interdecadal scale. • Does not capture full range of uncertainty as described by the full CMIP3 archive of projections. • Has not been reevaluated since completion in 2008—new methods, research are available. • Does not provide a single central tendency or most likely outcome that can be used for detailed/project level decision making • Unsure if selection of models provides the appropriate sampling needed for given DWR studies.	• Climate change is represented by a sequence of static (30-yr avg) snapshots, then mapped onto historic sequences • Does not capture extremes of temp, precip unless mapped to historical pattern • Does not allow for new (potentially enhanced) extremes not yet seen in historic sequence • Computationally burdensome—requires considerable resources and expertise to modify in any way. • Only available at two time periods; 2025, 2060 • Not yet thoroughly peer reviewed. • Collapses variability of multiple projections into ensemble average, potentially masking a more realistic representation of hydrologic variability. • Only maintains spatial continuity and structure of the projections by luck.	• All scenarios follow same sequence of wet and dry years as historical record (i.e. driest years on record are followed by very wet- 1976-79) • Provides relatively limited representation of extreme precipitation/drought years when compared to GCMs. • Most of the same weaknesses as BDCP.

Technical Criteria for Selecting Climate Scenarios

- Capturing precipitation variability is important
- Select among CAT, BDCP, or GCM scenarios using approach that yields the types of water-management-related cc changes most important
- Want to capture extremes, including extended dry periods, and observe 30 year running average precipitation
- Matching historical record is not a predictor of confidence of future projections
- Mimic historical variation
- Select scenarios that can be used for multiple planning purposes; that are inter-comparable to other agencies and institutions